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Original communication

Characteristics of asphyxial deaths in adolescence

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ABSTRACT

Review of 69 cases of lethal asphyxia in individuals aged from 10 to 18 years was undertaken in South Australia. There were 62 cases of suicide due to hanging (89.9%) (age range 10–18 years; mean = 16.6 years; M:F = 3.4:1), 4 accidents (5.8%) (3 crush asphyxias in motor vehicle rollovers, and 1 positional asphyxia associated with marked alcohol intoxication) and 3 homicides (4.3%). In the suicide group, there were 46 whites (74.2%), 12 Aboriginal (19.4%), 3 Asians (4.8%) and 1 African (1.6%). There were no deaths due to sexual asphyxia or the "choking game". However, the percentage of Aboriginal victims was disproportionately high compared to the percentage of the population aged 10–19 years listed as Aboriginal (approximately 3%). Thus, constant monitoring of local trends in mortality will identify if new activities such as the "choking game" have emerged, and also characterize specific problems that may exist in particular communities or cultural groups.

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1. Introduction

Accidental asphyxia in early life occurs in infants in shared sleeping situations, and in young children who either hang from ligatures such as curtain cords or who become wedged in defective cots.[1,2] As children become more mobile and begin to explore their environments, the nature of asphyxial deaths changes.[3] Little has, however, been written on asphyxial episodes in adolescents. Thus, in order to examine the circumstances of lethal asphyxial episodes occurring in adolescents and to determine the relative frequency of such events, the following study was undertaken.

2. Materials and methods

A retrospective review of cases of asphyxial deaths in individuals aged between 10 and 18 years was undertaken at Forensic Science SA over a 16-year period, from July 1994 to June 2010. All cases had undergone full autopsies with police and coronial investigations. The case files were reviewed and the age, gender, race and circumstances of death were tabulated. Forensic Science SA is the South Australian State forensic facility where medicolegal autopsies are performed. The population served is approximately 1.6 million.

3. Results

A total of 69 out of 522 adolescent deaths were attributed to asphyxia (13.2%). These consisted of 62 cases of suicide due to hanging (age range 10–18 years; mean = 16.6 years; M:F = 3.4:1), 3 cases of crush asphyxias in motor vehicle rollovers (male - 18 years, male - 15 years, female - 15 years), and one case of positional asphyxia associated with marked alcohol intoxication (male - 18 years; blood alcohol level 0.3%). In the latter case the victim had been had been found wedged in the rear of a vehicle. Of the cases of suicide there were 46 whites (74.2%), 12 Aboriginals (19.4%), 3 Asians (4.8%) and 1 African (1.6%). There were 3 cases of homicide (male - 18 years with a gag in his mouth, and 2 females - 15 years, who were both strangled). There were no cases of lethal sexual asphyxia or deaths due to the "choking game".

4. Discussion

In the population studied the most common circumstance involving death from asphyxia in adolescence was self-inflicted hanging. Suicides due to hanging accounted for 62 of 69 cases of lethal asphyxia (89.9%), with a preponderance of male victims. Methods of suicide are influenced, to some extent, by the accessibility of equipment, or situations that are perceived by the victim to be lethal. Thus, carbon monoxide toxicity using motor vehicle exhaust is a less common method of suicide in adolescents, than at other ages.[4]

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In a separate study we have shown that the proportion of hanging suicides in young South Australians (aged ≤17 years) has increased from 33.3 to 93.3% over two 5 year periods, 1995–1999 and 2005–2009, despite an overall decline in suicide numbers. The exact reasons for this local cluster remain uncertain, however it has been proposed that communication via internet-based social networking sites may be a factor.[5]

The distribution of hanging suicides among races demonstrated a disproportionately high percentage of Aboriginal victims. While the percentage of the population aged between 10 and 19 years listed as being Aboriginal in the Australian Bureau of Statistics database ranged from just 2.2–3.2% between 1995 and 2006 (average 2.7%),[6,7] the percentage of Aboriginal victims in the current study was 19.4%. A similar trend has been identified in a number of indigenous communities, with high suicide rates reported among young Maoris in New Zealand, and in Aboriginal communities in Canada. Suggested reasons for the high suicide rates include exposure to disadvantaged and adverse environments during childhood, and a sense of "collective despair" due to loss of culture and autonomy.[8–10] A higher incidence of mental health problems with suicidal ideation has also been identified among children and adolescents living in foster homes, and in those on remand pending trial or sentencing; the proportion of Indigenous adolescents on remand in Australia has been shown to be ten times that of the community in general.[11,12]

Although deaths due to sexual asphyxia are sometimes focused in the literature on young males, such events in the South Australian population appear rare under 19 years, with no cases occurring between 1994 and 2010. Typically, victims of autoerotic death involving asphyxia are young males (aged 15–25 years) who have been found suspended by a noose in a secluded or secure location. The presence of pornographic material and the wearing of female underclothing usually provides an indication at the scene of death due to misadventure.[13] Cases may be, however, difficult to diagnose in young females if such props have not been used or in cases where family members have interfered with the scene and removed material and devices that they may find embarrassing or offensive.[14–16]

A recent development in the area of adolescent asphyxial deaths has been the increase in the number of deaths attributed to the 'choking game'. This refers to the induction of episodes of cerebral hypoxia that cause brief periods of euphoria, and is known as "suffocation roulette", "flatliner" or "passout".[17,18] Episodes may be either self-induced or inflicted by another person. Although it has been asserted that the first cases were identified in 1995, cases involving similar behaviour were recognised decades before.[19] There have been at least 82 deaths in the United States associated with this type of activity in recent years. The age range of participants is 6–19 years (average 13.3 years), with a majority of deaths in males (86.6%).[17] Possible reasons for the increase in mortality from this activity include the increasing use of ligatures and individuals undertaking the activity alone.[20]

The absence of deaths due to the "choking game" in the South Australian data demonstrates that there is variability in the incidence of this activity among different populations. However, given the distribution of videos showing this activity on the Internet,[21] it is likely that adolescents in most communities will have some knowledge of it. While the "choking game" would appear to involve behaviour quite distinct from sexual asphyxia, it has been suggested that it may be the earliest manifestation of autoerotic asphyxial behaviour[22]; if this is the case, then communities reporting increases in cases of the "choking game" would also be expected to be reporting a subsequent increase in deaths from sexual asphyxia.

The current study has demonstrated that the majority of asphyxial deaths in adolescents in South Australia result from hanging suicides. Homicides are uncommon and other forms of accidental asphyxia, including those associated with autoerotic activity and the "choking game", are not usually encountered. However, given the difficulties that sometimes arise in identifying deaths due to autoerotic activity it is important that hanging cases are not automatically assumed to be suicides. In addition, younger adolescents may play games with ropes that are not sexually oriented and that may also result in lethal outcomes.[20]

The increase in deaths due to the "choking game" in some communities demonstrates that clinicians and pathologists need to maintain an awareness of changes in risk-taking behaviour that may occur in the young. It has, however, been shown in one recent study that one third of pediatricians and family physicians surveyed were not aware of the existence of the "choking game".[23] Ongoing evaluation of local trends in mortality at different ages is, therefore, necessary to identify and monitor new activities such as the "choking game" that may have a significant impact on death rates. Such monitoring may also be useful in identifying problems that may exist in specific communities, or in particular cultural and ethnic groups.

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